



INTRODUCTION

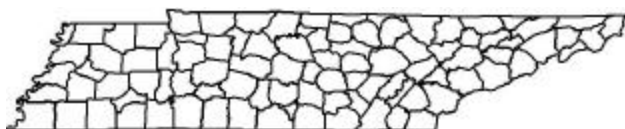
This chapter presents a general overview of the state of Tennessee. A brief description of the state's basic statistics, economy, land uses and trends, climate, and eight distinct landscape regions, called physiographic provinces are given. In each of the physiographic province sections (province), topography, major watersheds, geology, ground water (aquifer) regimes, soils, and primary nonpoint source pollution problems are discussed.

Water quality can be affected by point sources, such as municipal and industrial discharges, and by non-point sources, such as urban runoff, agricultural practices and construction activities. Only two percent of the state is occupied by urban and industrialized areas; however, the heaviest concentration of pollution problems in Tennessee occur in these areas.

On a regional basis, increased development threatens water quality in Middle Tennessee while agricultural runoff has a greater impact on West Tennessee waters. The effects of past mining and current re-mining tend to have the greatest impacts on water quality in the Cumberland Mountain region of East Tennessee.

A watershed is an area that drains to a particular lake or stream. Surface water in a watershed may flow across farm fields, forest land, suburban lawns and city streets, or it may seep into the soil and travel as ground water. There are 5 major watershed groups in the state. These watersheds, or hydrologic basins as they are often called, are discussed in detail in the Physiographic Provinces section.

BASIC STATISTICS



The state of Tennessee covers 42,244 square miles, encompasses 95 counties, and supports a population of over 5,112,800 people ⁽⁶⁾. There are over 60,000 stream miles and some 540,000

lake acres within Tennessee's boundaries. Approximately 74 percent of our stream miles and 78 percent of our lake acres have excellent water quality. However, we still face significant challenges in the continued improvement of Tennessee's water quality ⁽⁴⁾.

Water quality assessments made in 1996 included approximately 94 percent of the state's stream miles and, for the first time, 100 percent of the publicly owned lake acres in Tennessee. The number of stream miles assessed in 1996 increased by 38,247 miles over the 1994 assessment, giving us our best evaluation to date of statewide water quality.

Approximately 4.8 million people rely on public water systems for their drinking water. The state's public drinking water systems maintained a 97.3 percent compliance rate during 1996.

Most West Tennessee citizens rely on ground water for their drinking water. The city of Memphis has the largest ground water withdrawal (147 million gallons a day) of any municipality in the southeastern United States. For the state as a whole, approximately 1.5 million people rely on ground water from public water systems, some 300,000 people use combined ground water/surface water systems, and an additional 500,000 people get their drinking water from private wells and springs.



ECONOMY

The largest Tennessee employer is manufacturing. This includes the manufacturing of apparel, fabricated metal products, electronic and transportation equipment, appliances, chemicals, and food products. The printing and publishing industries are also very important.

The forestry products industry is the second largest Tennessee employer. This industry harvests about 800 million board feet per year of hardwood from oak, hickory, poplar, and elm making Tennessee the leader in the production of hardwood products. Hardwood products include flooring, log cabins, pencils, and lumber. Additionally, the harvesting of softwoods, such as pine and cedar, yield one billion board feet per year. Tennessee forests also produce soaps, turpentine, vanilla flavoring, toothpaste, newspaper, as well as furniture ⁽⁵⁾.

Tobacco is the leading crop in value, while other important economic crops include cotton, soybeans, hay, and corn. Primary sources of livestock income include beef and dairy cattle, swine, poultry, and equine operations.

Tennessee is the leading state in the production of ball clay, a key ingredient in ceramic and sanitary/whiteware production, and the harvesting of freshwater pearls and mussel shells associated with the jewelry industry. Tennessee ranks second in the production of zinc, while also extracting significant amounts of high - quality limestone, road aggregate limestone, aglime, barite, bituminous coal, dimension sandstone, high - silica sand, sand and gravel aggregate, oil, and natural gas. The state also has moderate deposits of copper, fullers earth, light - weight aggregate, marble, phosphate, and pyrite and significant reserves of lignite, a low grade, low sulfur coal (TN Division of Geology, 1992).

Major municipal centers:

- Chattanooga is the state's largest manufacturing center and a major insurance center.
- Gatlinburg and Pigeon Forge are neighboring tourist centers of great importance.
- Kingsport is a major printing and chemical production center.
- Knoxville is a major center for manufacturing and the home of the state's largest university.
- Memphis is the nation's second largest inland port and a leading distribution and higher education center.
- Nashville, the state's capital, is world - renowned for music recording and is a major insurance, banking, printing, health care, and higher education center.

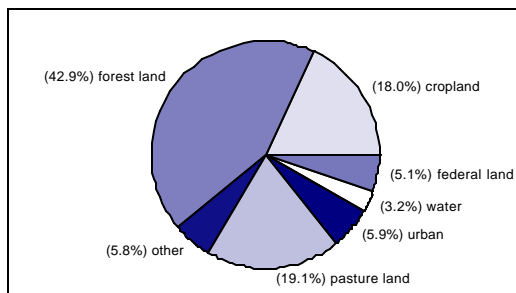
Aluminum is fabricated in Alcoa, while zinc is refined in Clarksville and transformed into sheets for pennies in Greeneville. Major wood and paper product facilities are located in the southeast and southwest portions of the state. At least three wineries exist in Tennessee, while whiskey is distilled in Lynchburg and Tullahoma. The Oak Ridge National Laboratory and University of Tennessee - Knoxville are nationally - recognized research institutions in nuclear and aerospace technology. The world's largest wind tunnel is located in the Engineering Development Center at the Arnold Air Force base in Tullahoma.

LAND USES AND TRENDS

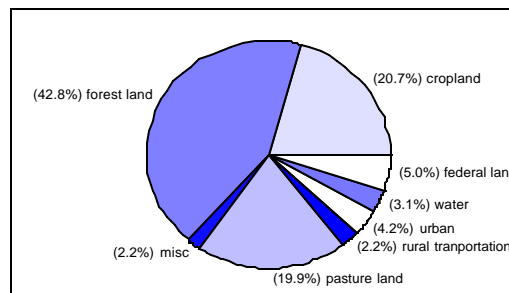
Nonpoint source pollution is often directly related to land use practices. Therefore, the types of land uses and land use trends are important factors in nonpoint source pollution mitigation and reduction. The greatest percentage (42.9%) of Tennessee's land area is dedicated to forested lands (11,580,000 acres or 18,094 square miles), while land areas used for agricultural activities (i.e., cropland and pastureland) ranked second at 37.1% (10,021,600 acres or 15,659 square miles) ⁽⁷⁾. The "Land Use In Tennessee – 1992" ⁽⁷⁾ figure below depicts the distribution of land uses in Tennessee.



Land Use in Tennessee - 1982



Land Use in Tennessee - 1992



CLIMATE

Tennessee has a temperate climate although rapid changes in weather conditions often occur. Variations in climate within the state are related to the diverse topography stretching from the lowlands of the Mississippi River bottoms in the west to the peaks of the Great Smoky Mountains in the east. Generally, the high terrains have cooler and wetter climates than the lowlands.

The average annual temperature varies from nearly 62 degrees Fahrenheit on the Mississippi River bottoms in the southwest to nearly 45 degrees Fahrenheit in the higher elevations of the east. Most of Tennessee is in the annual temperature range of 57 to 62 degrees Fahrenheit.

A significant portion of the state receives annual precipitation of 46 to 54 inches. The heaviest rains occur during late winter and early spring while the driest weather occurs during fall. East Tennessee is the site of both the largest and smallest average annual precipitation. The largest amount is about 80 inches per year atop the peaks of the Smoky Mountains, while the smallest is around 38 inches per year in the northeastern portion of the Valley and Ridge physiographic province. Average annual snowfall varies from four to six inches over most of the state except in the northeastern part where it is more than ten inches. A snow cover rarely lasts for more than a few days.

Southerly winds are frequent in all months of the year, but winds are strongest in summer. The average annual relative humidity is about 70 percent. Severe storms can be fairly common in Tennessee because of its positioning with respect to Pacific and Canadian weather systems versus weather systems originating in the Gulf of Mexico. Thunderstorms with strong winds, and occasional tornadic activity, are experienced at scattered locations throughout the state each year, mainly during the transitional seasons of spring and fall.

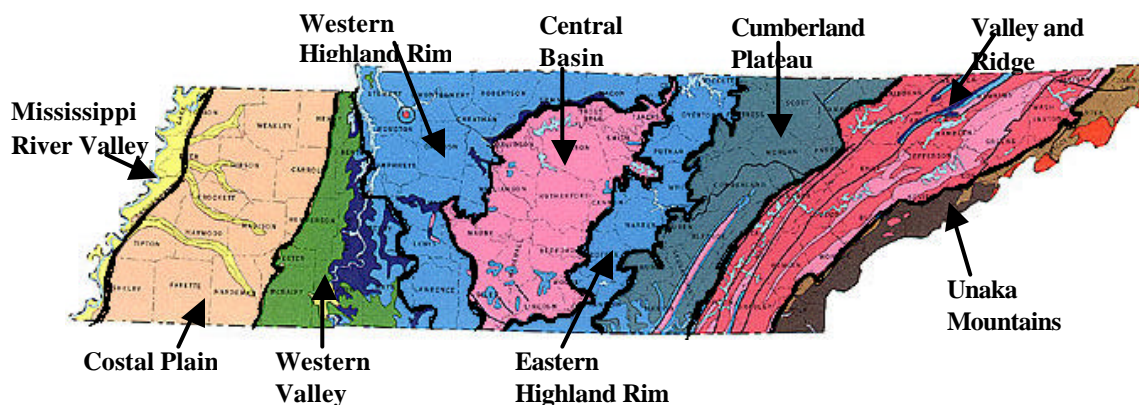
PHYSIOGRAPHIC PROVINCES

Tennessee's topography is among the most varied in the United States, ranging from wide, swampy river valleys in the west to mountains in the east with rolling hill country, karstic terrain, plateaus, mountains, deep gorges, and other features in between. Likewise, the subsurface geology (rock types and structure) and ground water aquifer configurations are quite varied. At least 700 caverns or caves (solution cavities) in association with karstic topographic features (open fractures, sinkholes, hummocky terrain, and subsurface drainage) serve as aquifers in 74 of Tennessee's easternmost counties ⁽¹⁾, while normal bedrock porosity serves as the aquifers in the state's westernmost counties.

On the basis of the distinct differences in topography and subsurface geology, Tennessee is divided into eight physiographic (or geomorphic) provinces. These provinces, from west to east, are the Mississippi River Valley, Coastal Plain, Western Valley, Western Highland Rim, Central

Basin, Eastern Highland Rim, Cumberland Plateau, Valley and Ridge, and Unaka Mountains. Although the state has been divided into 54 watersheds corresponding to the 8-digit USGS Hydrologic Unit Code (HUC); these watersheds are then combined in five groups according to year of implementation; Tennessee's water resources are divided into 14 major river basins. These river basins from west to east are Mississippi River Basin, Obion-Forked Deer River Basin, Hatchie River Basin, Memphis Basin, Western Tennessee Valley River Basin, Lower Cumberland River Basin, Upper Cumberland River Basin, Duck-Buffero River Basin, Elk-Shoal River Basin, Lower Tennessee River Basin, Upper Tennessee River Basin, Clinch River Basin, French Broad River Basin, and Holston River Basin.

The topography, major watersheds, subsurface geology, soils, vegetation, land uses, and primary nonpoint source pollution problems for each of these physiographic provinces are described in the following section.



Mississippi River Valley

The Mississippi River forms the western border of Tennessee, which is common to Arkansas and Missouri, with some variation because of river course changes since the boundary was established. From the Kentucky - Tennessee state line, the Mississippi River flows in a southerly direction for about 200 miles to the Tennessee - Mississippi state line. The Mississippi River flood plain in Tennessee is as much as 14 miles wide. Due to periodic flooding, the valley floor is continuously covered with sediment. The Mississippi River Valley province covers 637 square miles in Tennessee. The Mississippi River Valley province encompasses that portion of the Mississippi River basin within Tennessee and minor tributaries not included in the Obion - Forked Deer River, Hatchie River, or Memphis Basin. With the exception of portions of Memphis, which extends into this basin, there are no significant urban areas within the Mississippi River Valley province.

One of the most interesting geologic features of this physiographic province, Reelfoot Lake in the northwestern corner of Tennessee, is a result of the great New Madrid earthquakes of 1811 through 1813. Earthquakes, with three of the highest recorded readings (8.1 to 8.3 equivalence on the Richter scale) in the United States, occurred here to produce a shallow depression known as Reelfoot Lake. There are many deep - seated faults throughout much of this area, and some of the bluff lineations along the river valley, such as those adjacent to Reelfoot Lake, may trace these faults ⁽²⁾.

The Mississippi River Valley province is characterized by deposits of sand, silt, clay, and gravel and is a highly productive agricultural area and contains the highest percentage of crop and farm land in Tennessee. The nearly level valley bottom has soils with a high natural fertility, and medium to high available water capacities. Nearest the river the soils are loamy and well to moderately well - drained. Generally, the soils become more clayey and wetter with distance



from the river. In back swamp and old slough areas, where fine - textured sediment settled out of still or slow - moving water, soils are dark colored, clayey, and poorly - drained. The soils on the upland and floodplain are susceptible to erosion.

Most of the land is intensively cultivated in soybeans, cotton, and corn. Flooding and excess water are problems for development and agriculture in this region. Efforts to control the natural, cyclical flooding of the flood plain, and drain the once extensive riverine wetlands, many miles of levees, dikes, and channelization projects have been constructed along the rivers in this province.

The primary nonpoint source pollution sources in the Mississippi River Valley basin result from agriculture, active and abandoned mining (sand and gravel), failing septic systems, hydromodification, and construction. The extensive hydromodification projects, along with the naturally erodible soils in the province, have exacerbated the nonpoint source pollution problems.

Coastal Plain

The Coastal Plain of West Tennessee is an area of relatively low elevation and relief with sediments having the same characteristics as the coastal provinces of other southeastern states. This province of the state may be divided into two components, the West Tennessee Plain to the west and the West Tennessee Uplands to the east ⁽³⁾.

West Tennessee Plain

The West Tennessee Plain component of the Coastal Plain province is a zone of less hilly, in some places nearly flat, terrain that slopes gently westward toward the Mississippi River. Its western limit is marked by low bluffs (about 100 feet) adjacent to the Mississippi River flood plain. The most prominent topographic features of the Coastal Plain of West Tennessee are these bluffs and the broad flood plains of meandering streams.

The West Tennessee Plain physiographic province includes three major watersheds: Obion - Forked Deer River, Hatchie River, and the Memphis Basin.

In Tennessee, the Obion - Forked Deer and Hatchie Rivers encompass 4,412 and 1,877 square miles, respectively. Topography is characterized as gently rolling, interrupted by small streams and drainage divides. Some gullied topography has developed and wetlands are common.

The Memphis Basin covers 1,461 square miles, and includes the Loosahatchie and Wolf River watersheds along with the Nonconnah Creek watershed. Topography in the Memphis Basin is characterized as gently rolling, interrupted by small streams and drainage divides. Some gullied topography has developed and wetlands are common. Normal ground water regimes exist in porous unconsolidated sediments and overlying porous soils throughout this province.

West Tennessee Uplands

The West Tennessee Uplands component includes the divide between the Tennessee and Mississippi River drainages. The average elevation in the uplands is about 500 feet, with some elevations over 700 feet in Natchez Trace State Park and Forest. The West Tennessee Uplands encompasses portions of three major watersheds: Hatchie River, Obion River, and Western Tennessee Valley.

The geology of the West Tennessee Uplands is characterized by age sand, with lesser amounts of silt, clay, and gravel. These deposits are marine and nonmarine in origin.

The West Tennessee Uplands province is an important farming area and has one of the highest percentages of crop land in Tennessee. Soybeans, cotton, and corn are the main



crops. In the West Tennessee Uplands, most of the good crop land is in the wide bottoms and adjacent terraces, and in small scattered tracts in the uplands. Soybeans, cotton, and corn are grown extensively on the bottoms and low terraces and in small fields in the uplands. The uplands are used largely for hay meadows, pasture, and forests.

The primary nonpoint source problems in this province stem from the highly erosive soils, and extensive hydromodification in the region. Excessive sedimentation in the streams is a major source of nonpoint source pollution. This area has undergone vast hydromodification, such as channelization and flow modification, which has negatively impacted water quality. The extensive agricultural activities in this basin are also sources of nonpoint source pollution. Other sources of nonpoint source pollution are natural, animal holding lots, active and abandoned mining (ball clay, fullers earth, river and terrace gravels), failing septic systems, silviculture, streambank modifications, lack of riparian vegetation, and stormwater.

The Memphis Basin is also impacted by pasture land runoff, urban runoff, land development, and road and bridge construction, as well as industrial and municipal point sources.

Western Valley

The Tennessee River in West Tennessee flows northward across the state for approximately 110 miles serving as the demarcation line between middle and west Tennessee. The sides of the river valley are extensively dissected by many small tributaries. The valley is as much as 20 miles wide, and its flood plain ranges in width from three and one - half to one and one - half miles ⁽³⁾. The Western Tennessee River basin covers 3,905 square miles of land and water area.

The geology of the Western Valley province is dominated by limestone, chert, shale, and sandstone of the Devonian to Silurian ages. The soils are typically fluvial deposits of sand, silt, and gravel. Normal ground water regimes exist in porous bedrock and overlying porous soils in the western portion, while fracture - and solution cavity - controlled ground water regimes exist beneath the normal ground water regimes of the overlying porous soils.

The primary sources of nonpoint source pollution in this province arise from agriculture, active and abandoned mining (limestone), failing septic systems, silviculture, and hydromodification, such as channelization, dredging, and impoundments. The portion of the Tennessee River in this region has two large impoundments at the Kentucky and Pickwick dams. These impoundments can create nonpoint source pollution from poor quality dam discharge waters. These impoundments create higher water levels and slower flow rates conducive to nonpoint source pollution throughout the province.

Western Highland Rim

The Western Highland Rim is characterized by dissected, rolling terrain that is crossed by numerous streams. The Highland Rim physiographic province encompasses portions of four major watersheds: Lower Cumberland River, Upper Cumberland River, Duck River, and Elk Shoal.

Eastern Highland Rim

The Eastern Highland Rim is marked by a highly dissected steep slope that rises from the rolling lowland area of the Central Basin. Cutting into the rim are numerous narrow valleys, some of which have waterfalls. Along the outer ten miles of the south-central part of the Eastern Rim is an area of nearly flat terrain known as the Barrens, principally in Coffee, Cannon, and Warren counties. This area is unusually level and contains numerous swamps ⁽³⁾. The Eastern Highland Rim physiographic province encompasses portions of the major watersheds: Lower Cumberland River, Upper Cumberland River, Duck River, and Elk - Shoal River.



The Highland Rim, in general, is composed of predominately Mississippian - age limestone, shale, siltstone, sandstone, dolomite, and chert. A dominant feature of the Highland Rim is karst (an area of irregular limestone where erosion has produced sinkholes, fissures, underground streams, and caverns) terrain. Karstic topography is prominent in two extensive areas of the Highland Rim. One area is found in the Western Highland Rim just north of Clarksville and Springfield to many miles into Kentucky; the other less extensive area is found in the Eastern Highland Rim. In addition to these two karstic areas, there are as many as 300 known caves and a plethora of sinkholes throughout the Highland Rim⁽¹⁾. Fracture - and solution cavity - controlled ground water regimes exist beneath the normal ground water regimes of the overlying porous soils. The thin soils of the karstic areas do not provide the natural filtration and cleansing function that is typical of thicker soils.

Generally, the soils of the Highland Rim are very thick, strongly acidic, highly leached, well - drained, and low in natural fertility.

The largest areas of good crop land in the Highland Rim physiographic province are on the eastern part near the Kentucky - Tennessee state line. Suitable crop land is interspersed in forest land in small tracts on the western part. Pasture lands, hay meadows, and tobacco fields are the leading agricultural land uses. Corn and soybeans are locally important.

The primary sources of nonpoint source pollution in this province are agriculture, active and abandoned mining (limestone), failing septic systems, silviculture, reservoirs among other hydromodifications, and problems related to karstic terrain.

Central Basin

The Central Basin is a semi - curved area enclosed by the Highland Rim. It is characterized by gently rolling to hilly terrain, with some nearly level areas, and by meandering, low - gradient streams. It was formed by the erosion of the Nashville Dome, the structural center of which coincides with the geographic center of the basin. Murfreesboro is adjacent to the center (Miller, 1974).

The Central Basin physiographic province encompasses four major watersheds: Lower Cumberland River, Upper Cumberland River, Duck River, and Elk - Shoal River.

The outer areas and major drainage divides of the basin are characterized by hilly terrain. There are numerous hills capped by siliceous rock, some nearly 1,300 feet in elevation. The inner part of the basin is less hilly than the outer areas. These areas are further characterized by the lack of surface drainage and by other karst features such as caves and sinkholes.

The geology of the Central Basin is characterized by marine limestone, dolomite, and shale, and nonmarine sandstone and conglomerates. These rock units are Ordovician in age. Karst features, such as sinkholes, cave systems, and subsurface drainage are abundant in the carbonate bedrock. At least 240 known caves exist in the Central Basin province⁽¹⁾. Fracture - and solution cavity - controlled ground water regimes exist beneath the normal ground water regimes of the overlying porous soils.

The soils of the outer part of the Central Basin are generally moderately steep, well drained, and have clayey subsoils of moderately slow to slow permeability. They are typically high in phosphorus. The soils in the interior portion of the Central Basin are undulating and many are thin.

Soils suitable for row crops are in small tracts on bottoms and benches, pasture lands and hay meadows are the leading agricultural land uses. Many of the steepest slopes are in forest.



Several larger urban centers are located in the Central Basin, including Nashville, Franklin, Gallatin, Lebanon, and Murfreesboro.

Primary nonpoint source pollution problems in this province are related to agriculture, active and abandoned mining (limestone and phosphate), failing septic systems, silviculture, reservoirs along the Cumberland River and its tributaries, other hydromodifications, urban runoff, and karstic terrain.

Cumberland Plateau

The Cumberland Plateau, immediately east of the Highland Rim, is the name given to the southern portion of the structural province known as the Appalachian Plateaus. The east side forms a prominent escarpment, whereas the western margin is more irregular. The average height of the east side escarpments is 900 feet. The general plateau elevation is approximately 1,700 to 1,900 feet. Although essentially flat throughout most of its extent, the Cumberland Plateau has some rolling terrain and mountains which rise above the general plateau level. Mountainous areas north of Oak Ridge have elevations over 3,000 feet, with the highest point being Cross Mountain at 3,534 feet ⁽³⁾.

Dissecting into the plateau are numerous deep gorges and two prominent linear valleys: the Sequatchie Valley in the southwest and the much smaller Elk Valley in the northeast. Sandstone capping the plateau forms prominent cliffs and many waterfalls. The best known and highest waterfall (256 feet) is Fall Creek Falls, located in Van Buren County (Miller, 1974)

The Cumberland Plateau includes portions of three major watersheds: Upper Cumberland River, Lower Tennessee River, and Upper Tennessee River.

The soils on the Cumberland Plateau have formed from the sandstones and shales are predominately well - drained and loamy. Soil thickness varies from one to four feet. These soils are very strongly acidic and low in natural fertility, but respond well to proper management. Ledges of sandstone are common on slopes.

Most of the Plateau is in mixed hardwood forests. Pasture lands and hay meadows are the leading agricultural land uses, while small fields of corn, small grain, tobacco, and vegetables are grown.

The primary nonpoint source problems in this province arise from agriculture, active and abandoned surface and subsurface coal mining, failing septic systems, silviculture, hydromodifications, such as dams and channelization, storm water, and sewer overflow.

Valley and Ridge

The Valley and Ridge province, sometimes referred to as the Valley of East Tennessee, extends from the steep slope of the Cumberland Plateau on the west to the Unaka Mountains on the east. This province is characterized by numerous, elongate, parallel ridges and intervening valleys, all trending in a northeast - southwest direction. This orientation is the result of folding and fracturing during a mountain building episode 230 to 260 million years ago. The most prominent ridges are to the north: Clinch and Powell Ridges, and Bays Mountain ⁽³⁾.

The Valley and Ridge province includes five major watersheds: Clinch River, Holston River, French Broad River, Lower Tennessee River, and Upper Tennessee River.

The rocks which form the Valley and Ridge physiographic province are Cambrian to Ordovician - age limestones, dolomites, siltstones, sandstones, shales, and cherts. Fracture - and solution cavity - controlled ground water regimes exist in the bedrock beneath the normal ground water regimes of the overlying porous soils.



The soil pattern in this province is complex as a result of the heterogeneous geology. The soils are predominately well drained, with most being highly leached and low in natural fertility.

Suitable soils for crop land are in small tracts. Much of the land is productive for pasture and hay. The leading agricultural land uses are pasture lands, hay meadows, tobacco fields, and small scattered fields of corn, small grain, and soybeans. Many of the highest and steepest ridges are in forests

The primary nonpoint source pollution sources in this province are related to agriculture, active and abandoned mining (barite, high - silica sand, limestone, marble, shale, and zinc), failing septic systems, silviculture, hydromodification (e.g. dams, channelization, streambank modifications, upstream impoundments), storm water, and urban runoff. The best land for agriculture and urban growth is in the narrow, flat valley bottoms. The scarcity of flat land results in riparian buffer zones being greatly reduced or completely absent, which exacerbates nonpoint source pollution problems arising from surface runoff.

The Unaka Mountains

The Unaka Mountains in eastern Tennessee are a part of the Appalachian Mountains that are referred to as the Blue Ridge elsewhere. These mountains are characterized by rugged terrain, heavily forested slopes, and rushing streams with waterfalls. The highest point in Tennessee is Clingman's Dome, with an elevation of 6,642 feet. The Great Smoky Mountains are that portion of the Unakas located within the Great Smoky Mountains National Park. The Unakas also include outlying ridges which include Chilhowee, English, Bean, Meadow Creek, Holston, Starr, Roan, and among others (Miller, 1974).

The Unaka Mountains province includes four major watersheds: Holston River, French Broad River, Lower Tennessee River, and Upper Tennessee River.

The oldest rocks in Tennessee are found in the Unaka Mountains. The Unaka Mountains are composed of pre - Cambrian and Cambrian igneous (granite and rhyolite), metamorphic (gneiss, quartzite, slate, schist, and phyllite), and meta - sedimentary (sandstone, conglomerate, arkose, and graywacke) rocks. Normal ground water regimes exist in the semi - porous bedrock and overlying porous soils.

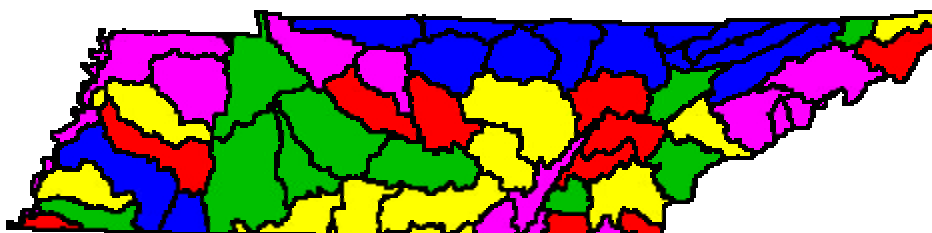
The soils of the Unaka Mountains are predominately well - drained to excessively drained, and are rich in weatherable minerals, such as micas, feldspars, and iron sulfides (in the Copper Basin). The soils are loamy and contain varied amounts of rock fragments.

The Unaka Mountains are mostly forested. Exceptions to this are the broader peaks or "balds" which are covered with meadows and groves of mountain laurel and the coves which have been used for pasture lands by previous property owners. Much of this region is located within the Great Smoky Mountains National Park and the Cherokee National Forest lands.

The primary sources of nonpoint source pollution in this province are related to agriculture, failing septic systems, silvi culture, hydromodification activities, and urban growth.

Major Watersheds of Tennessee

NPS Management Program Document – Appendix E
General Characteristics of Tennessee



	West Tennessee	Middle Tennessee	East Tennessee
Group 1	<ul style="list-style-type: none"> • Nonconnah • South Fork of the Forked Deer 	<ul style="list-style-type: none"> • Stones • Harpeth 	<ul style="list-style-type: none"> • Tennessee (in Meigs & Rhea Counties) • Watts Bar • Ocoee • Emory • Watauga
Group 2	<ul style="list-style-type: none"> • Loosahatchie • North Fork Forked Deer • Forked Deer 	<ul style="list-style-type: none"> • Collins • Caney Fork • Wheeler Lake • Upper Elk • Lower Elk • Pickwick Lake 	<ul style="list-style-type: none"> • Hiwassee • Fort Loudoun / Little • South Fork Holston
Group 3	<ul style="list-style-type: none"> • Wolf • Tennessee Western Valley (Beech) • Tennessee Western Valley (KY Lake) 	<ul style="list-style-type: none"> • Upper Duck • Lower Duck • Buffalo 	<ul style="list-style-type: none"> • Tennessee (Hamilton Co. w/o Chattanooga) • Little Tennessee • Lower Clinch • North Fork Holston
Group 4	<ul style="list-style-type: none"> • Lower Hatchie • Upper Hatchie 	<ul style="list-style-type: none"> • Red • Barren • Cumberland (Old Hickory Lake) • Upper Cumberland (Cumberland Lake) • Upper Cumberland (Cordell Hull) • Obey 	<ul style="list-style-type: none"> • South Fork Cumberland • Upper Cumberland • Powell • Upper Clinch • Holston • Tennessee (Chattanooga Area)
Group 5	<ul style="list-style-type: none"> • Mississippi • North Fork Obion • South Fork Obion 	<ul style="list-style-type: none"> • Lower Cumberland (Lake Barkley) • Lower Cumberland • Gunter'sville Lake 	<ul style="list-style-type: none"> • Tennessee (Marion County) • Sequatchie • Conasauga • Upper French • Lower French • Pigeon • Nolichucky



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